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10/074,022

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EXAMINER

FILIPCZYK, MARCIN R

ART UNIT

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2163

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                               |                               |  |
|------------------------------|-------------------------------|-------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/074,022 | Applicant(s)<br>RHOADES, JOHN |  |
|                              | Examiner<br>Marc R. Filipczyk | Art Unit<br>2163              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 and 37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This action is responsive to Applicant's RCE request and amendment submitted on March 18, 2007.

**To expedite the process of examination Examiner requests that all future correspondences in regard to overcoming prior art rejections or other issues (e.g. amendments, 35 U.S.C. 112, objections and the like) set forth by the Examiner that Applicants provide and link to the most specific page and line numbers of the disclosure where the best support is found (see 35 U.S.C. 132).**

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/18/2007 has been entered. Claims 1-13, 15-25 and 37 are now pending.

#### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation of plurality of look up state machines connected in parallel with the same look up table must be shown or the feature(s) canceled from the claim(s). Note, figure 1 shows a look up table but is not interrelated with figure 2. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

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sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-13, 15-25 and 37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The basis of this rejection is set forth whether the invention accomplishes a practical application and whether it generates a useful, concrete and tangible result.

The guidelines explain that a practical application of a 35 U.S.C. 101 judicial exception is claimed if the claimed invention physically transforms an article or physical object to a different

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state or thing, or if the claimed invention otherwise produces a useful, concrete, and tangible result.

In the present case, independent claims 1, 21, 22 and 23 do not involve transformation of article or physical object to a different state or thing, they merely recite looking up data. Further, independent claims 1, 21, 22 and 23 do not produce a useful, concrete, and tangible result, but merely lookup data. State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02.

Claims 1, 21, 22 and 23 taken as a whole are directed to a mere method and system claim, i.e., to only its description or expression, is an abstract idea, further the aspect of enabling in the claims does not perform any actual function and therefore the claims do not comprise a practical application as explained above hence are nonstatutory.

Since the claimed invention, as a whole, does not comprise a practical application as explained above, claims 2-13, 15-20, 24, 25 and 37 which depend from claims 1, 21, 22 and 23 respectively, are deemed to be directed to non-statutory subject matter.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the **second paragraph** of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-13, 15-25 and 37, the term "enable" is indefinite. To enable means to permit an event take place but does not require such an event take place. In the pending claims, if no look up is performed than no result is generated.

Second, the aspect of "multiple look ups... be carried out in the same look up table" is indefinite. This feature could cause an overload, however the claimed system/method does not handle such a scenario.

Regarding claims 2-13, 15-20, 24, 25 and 37 which depend from claims 1, 21, 22 and 23 respectively, are rejected on the same basis.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 21-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Tock et al (U.S. Patent No. 6,115,802)..

Regarding claims 1 and 21-25, Tock discloses a system and method, wherein a look up engine (fig. 2a and 3 and abstract) comprising a storage means for storing a look up table, said look up table comprising a plurality of entries, each entry comprising a value, an associated key value (fig. 4), such that, in operation, a look up is carried out by outputting a value which is associated with the stored key value which matches an input key value (fig. 3, items 309 and

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313), the look up engine comprising a plurality of look up state machines connected in parallel (fig. 3) to enable multiple look ups of different search requests to be carried out in the same look up table concurrently (col. 9, lines 2-8), the state machines all having concurrent access to all the entries in the look up table when they perform a look up.

*(Note: Hash table is intended for multi-threaded environment, col. 6, lines 65-67)*

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-13, 15-25 and 37 are rejected under 35 U.S.C. 103(a) as best as the Examiner is able to ascertain as being unpatentable over Greene (U.S. Patent No 6,631,419) in view of Wilkinson III et al (U.S. Patent No. 6,014,659).

Regarding claims 1 and 21-25, Greene discloses a system and method, wherein a look up engine (fig. 1, 106, Greene) comprising a storage means for storing a look up table, said look up table comprising a plurality of entries (fig. 1, 108, Greene), each entry comprising a value, an associated key value (col. 7, lines 32-34, Greene), such that, in operation, a look up is carried out by outputting a value which is associated with the stored key value which matches an input key value from different search requests (Fig. 1, item 102, values D1, D2 and col. 4, lines 49-52, col. 7, lines 34-36, Greene), the look up engine being capable to perform multiple look ups of the

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same look up table concurrently (fig. 1, 106 and 108, and col. 4, lines 55-67, col. 7, lines 10-18 and col. 31, lines 60-67, Greene) the state machines all having concurrent access to the entries in the entire table when they perform a look up (fig. 1, item 108 and col. 8, lines 12-35), but does not explicitly teach the look up engine comprises a plurality of look up state machines connected in parallel.

*(Note: Arrays or table [A1, A2, A3] comprises entries with prefixes of a preset length, wherein prefixes of less than 22-bits and prefixes greater than 22-bits are searched concurrently by portion of a search key)*

However, search engines are notoriously well known to comprise multiple state machines to handle multitasking. For instance, Wilkinson discloses prefix matching database searching (see title and abstract, Wilkinson) where he teaches a number of registers and elementary state machines operating concurrently, collectively known as a search engine, to directly access memory (fig. 3, item 40, col. 8, lines 2-4 and col. 15, lines 21-25, Wilkinson). Hence, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Greene and Wilkinson systems by modifying Greene's look up engine to include the plurality of look up state machines taught by Wilkinson to support Greene's multiple input strings and multiple memories to operate concurrently as suggested by Greene (col. 31, lines 60-64, Greene) and taught by Wilkinson.

*(Note: a table may be partitioned to a plurality of tables, table and tables are interchangeable, hence, performing operations on many tables is equivalent to performing operations on one table)*



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Regarding claim 2, Greene/Wilkinson teach entries are stored in a trie structure (col. 7, lines 27-37, Wilkinson).

Regarding claim 3, Greene/Wilkinson teach the trie structure is a PATRICIA trie structure (col. 3, lines 15-22 and 30-58, Greene).

Regarding claim 4, Greene/Wilkinson teach input and output buffers (fig. 1, item 102 and col. 6, lines 47-56, Greene).

Regarding claims 5 and 6, Greene/Wilkinson teach distributing and collecting the input key values and respective outputs (fig. 1, items 14, 20, 22 and 40, col. 9, lines 63-66, Wilkinson).

Regarding claims 7 and 8, Greene/Wilkinson teach the length of the look up values and key values is fixed and/or variable (fig. 17 and col. 2, lines 7-21, Greene).

Regarding claim 9, Greene/Wilkinson teach tagging keys (col. 26, lines 32-49, Greene).

Regarding claim 10, Greene/Wilkinson teach storing an identity of the requestor such that the output value is sent to the correct location (fig. 3, item 14, Wilkinson).

Regarding claims 11-13, Greene/Wilkinson teach a type of error and identifying the location of bits that are mismatched (fig. 5, BIT MASK, and col. 31, lines 14-22, Wilkinson).

Regarding claim 37, Greene/Wilkinson teach an entry further comprises a skip value (figs. 1-5 and col. 7, lines 36-50 and col. 8, lines 36-50, Greene), and the input key comprises a plurality of bits such that, if the skipped bits of the input key value and the associated skip value mismatches, an error message is output to indicate lookup failure (col. 9, lines 10-15 and 35-48, Greene).

*(Note: if there is no match, an error flag may be displayed)*

Regarding claims 15-20, Greene/Wilkinson teach internal/external memory and partitioning the memory comprising plurality of entries (fig. 1, item 108: M1, M2, M3 and col. 7, lines 14-18, Greene).

### ***Response to Arguments***

Applicant's amendment and arguments filed March 18, 2007 have been fully considered but they are not persuasive. The arguments and responses are listed below.

Applicant argues on pages 7 and 8 in the 3/18/07 response that Greene processes data sequentially and not concurrently as claimed and that overlapped data is not truly concurrent.

Examiner disagrees. Arrays or table [A1, A2, A3] comprises entries with prefixes of a preset length, wherein prefixes of less than 22-bits and prefixes greater than 22-bits are searched concurrently by portion of a search key. Multiple field look ups are performed on a table represented by three memories M1-M3 which comprise data values (col. 31, lines 61-64). Searching/looking up data is performed concurrently/simultaneously by concurrent processing to

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handle multi-tasking, see the disclosure of simultaneous processing in Greene in col. 8, lines 29-35. Further, Examiner notes that overlapping thread processing is equivalent to concurrent processing.

Applicant argues on pages 8 and 9 that Greene's partial searches are not different searches and are pipelined.

Examiner disagrees. Greene provides a plurality of searches which are therefore different searches, see Greene in col. 8, lines 29-35. Applicant also teaches pipelining, see item 202, "FIFO" of figure 2, instant case.

With respect to Wilkinson, the system teaches state machines operate concurrently (col. 15, lines 20-27) to concurrently access memory (col. 21, lines 35-57). Concurrent processing mandates handling more than one request. Further, overlapping thread processing is equivalent to concurrent processing. Greene in view of Wilkinson disclose performing multiple look ups on the same table.

With respect to all the pending claims 1-13, 15-25 and 37, Examiner respectfully traverses Applicant's assertion based on the discussion and rejections cited above.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art teaches a parallel look up system:

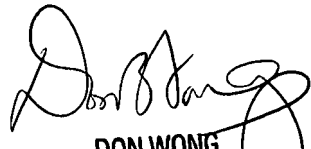
U.S. Pub. No. 2003/0004921 of Schroeder; figs 2 and 3, and par. [0024].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc R. Filipczyk whose telephone number is (571) 272-4019. The examiner can normally be reached on Mon-Fri, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MF  
May 24, 2007

  
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